

A.2.35 AOC 21

Description

AOC 21 is located near the corner of Maurer Road and State Street, adjacent to the driveway to Chevron's No. 2 Fuel Oil Loading Rack. This area was included as an AOC based on the identification of potentially contaminated soil encountered during the excavation to locate and repair a leak in the Refinery Fire Water System. The potentially contaminated soil was limited to a one square foot area located on the northwestern wall of the excavation. The age, origin and volume of the release are unknown. Although AOC 21 was originally identified based on this small area located just north of Maurer Road, it has been extended northward to Woodbridge Creek to include the strip of land located between the railroad right-of-way and State Street.

As shown on Figure A.2.31 and summarized on Table A.2.31, data from 23 borings, 19 soil samples, and water samples from three groundwater monitoring wells, one temporary piezometer and seven hycropunches have been used to characterized this AOC. Data from nearby PAOCs are also shown on Table A.2.31 for delineation purposes.

An initial boring (SB0186) was installed during the 1st-Phase Soils Investigation to characterize the soils in the area of the northwestern wall of the former excavation area. TPH analytical results for this boring indicated that No. 2 fuel oil was present in the sample. Therefore, four additional borings (SB0200, A02102, A02103 and A02104) were installed during the 1st-Phase RFI Soils Investigation to determine the extent of impacted soils in this area. Additionally, two borings (S0461 and S0462) were installed to determine if soils within the area of groundwater sampling points H0124 and H0125 warranted further investigation. One sample from each boring (S0461 and S0462) was collected and analyzed for Skinner's List VOCs and SVOCs. In addition, one of these two samples was analyzed for TPH fingerprint.

The remaining fifteen soil samples were collected and analyzed for TCL VOCs and SVOCs, and metals during the Full RFI. Two samples were also analyzed for SPLP metals and physical characteristics¹. Three monitoring wells and one temporary piezometer were also installed during the Full RFI to evaluate groundwater and potential LNAPL impacts, respectively, within AOC 21. Samples from the monitoring wells and piezometer were analyzed for TCL VOCs and SVOCs, TCL metals, and water quality parameters.

Soils

The following table summarizes the number of samples where the soil delineation criteria were exceeded within AOC 21:

¹Physical characteristics specified in Appendix A, Task IV of Module III of the HWSA Permit included saturated and unsaturated permeability tests, moisture content, relative permeability, bulk density, porosity, soil sorptive capacity, CEC, TOC, pH, Eh and grain size distribution.

Constituents of Concern	Surface Soils (0 to 2 ft)	Fill Material (>2 ft)	Native Soils	Totals
Benzene	0/4	1/10	0/5	1/19
Other VOCs	0/4	1/10	0/5	1/19
Benzo(a)pyrene	0/4	1/10	0/5	1/19
Other SVOCs	0/4	1/10	0/5	1/19
Lead	0/4	1/6	0/5	1/15
Arsenic	0/4	2/6	0/5	2/15
Other TAL Metals ^a	0/4	2/6	0/5	2/15

^aTotals do not include naturally occurring metal compounds in excess of the delineation criteria (Al, Ca, Fe, Mg, Mn, K and Na).

Surface Soils

The four surface soil samples collected within this AOC contained no soil delineation criteria exceedances, except for naturally-occurring iron.

Fill Materials (>2 feet bgs)

Many of the borings installed within AOC 21 exhibited staining, odor, and/or elevated PID readings within the fill material. The fill layer ranges in thickness from approximately two to 13 feet.

Two of the 10 samples collected in the fill unit of AOC 21 contained exceedances of the soil delineation criteria, other than naturally occurring iron. Benzene (75 mg/kg) and several other VOCs, benzo(a)pyrene (1.4J mg/kg) and several other PAHs were detected above the applicable soil delineation criteria in one sample (S0874D1). Arsenic (53.2 and 65.3 mg/kg) was detected above the applicable soil delineation criterion in two samples (S0874D1 and S0864C3, respectively). These arsenic concentrations are within the normal range for soils, particularly glauconitic soils in the Coastal Plain (Sanders, 2003). Lead (420 mg/kg) and zinc (2,160 mg/kg) were also detected above the applicable soil delineation criteria in S0874D1. The fingerprint analysis of sample SB0186 showed No. 2 fuel oil present in that sample.

The SPLP sample from MW-135 (S0839) contained 3.27 mg/L of naturally-occurring aluminum and 3.85 mg/L of naturally-occurring iron, which slightly exceed the applicable criteria for SPLP aluminum (2.2 mg/L) and SPLP iron (3.3 mg/L), respectively². No other metals were detected above the applicable SPLP criteria in this sample. Therefore, the soils are not a source of metal impacts to groundwater.

²Based on the groundwater criterion for aluminum (200 µg/L), DAF = 11; and iron (300 µg/L), DAF = 11.

Native Material

The five native soil samples collected within this AOC contained no exceedances of the soil delineation criteria, except for naturally-occurring iron. Therefore, the site-related soil impacts have been delineated vertically.

As discussed further in Section 6 of the RFI Report, lateral delineation of selected COCs has been completed on a site-wide basis for each Yard. The delineation of these COCs is depicted graphically on the figures provided in Section 6.

Groundwater

Benzene was detected above the applicable delineation criterion in two of the four recent groundwater samples collected from monitoring wells and the temporary piezometer installed during the Full RFI within AOC 21. Samples from MW-134 and MW-135 contained benzene (8 µg/L and 3J µg/L respectively) above the groundwater delineation criterion. The sample from MW-134 also contained n-propylbenzene at concentrations (150 µg/L) exceeding the groundwater delineation criterion. Thallium was the only metal, other than naturally-occurring metals, detected in recent groundwater samples (MW-158 contained 22.4 µg/L and temporary piezometer A21TP1 contained 126 µg/L) collected from within AOC 21. A more detailed discussion of potential groundwater impacts to AOC 21 can be found in Section 8 of the RFI Report.

Summary

Only two samples, both from the fill layer in the northernmost portion of AOC 21, contained exceedances of the soil delineation criteria. One sample contained VOCs, PAHs, and metals (arsenic and lead) above the delineation criteria, while a second sample from this area only contained arsenic above soil delineation criteria. There is no evidence of ongoing contamination associated with the No. 2 fuel oil observed in the southern portion of AOC 21 in 1996.

Benzene and n-propyl benzene were detected above the applicable groundwater delineation criteria in the groundwater sample from MW-134. Thallium was the only other COC detected in groundwater above the applicable delineation criteria at AOC 21.

In conclusion, the northern portion of AOC 21 will be included for evaluation of both soils and groundwater in the CMS.